

# Standardized Corrosion Testing

**S**outhwest Research Institute® (SwRI®) has over 20 years of experience in addressing industrial corrosion problems. SwRI has extensive test facilities and state-of-the-art instrumentation to assess all aspects of corrosion and materials failure. Corrosion research is supported by a multidisciplinary group of engineers, scientists and technical staff who offer a comprehensive approach to solving corrosion problems in government and industry.

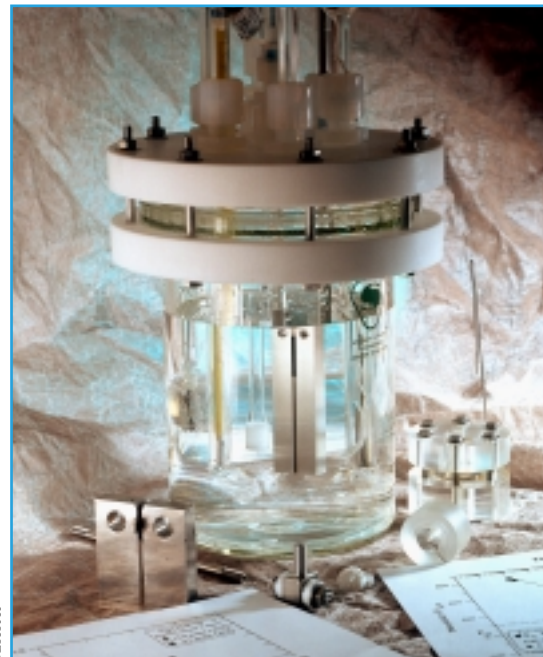
Customized tests designed to meet client specifications enable Institute engineers to address the long- and short-term needs of the client and provide flexibility in testing. SwRI engineers can offer a broad-based view of corrosion through long-term exposure testing, materials selection and life prediction studies, and failure evaluation.

## *Electrochemical Testing*

The Environmental Performance of Materials (EPM) Laboratory at SwRI has the latest electrochemical instrumentation capable of monitoring materials performance in corrosive environments. SwRI's electrochemical testing program capabilities include testing and evaluation of corrosion rates, galvanic corrosion, uniform corrosion, impedance, and pitting. Using data generated from these studies, SwRI scientists and engineers analyze corrosion mechanisms and develop innovative solutions to mitigate the effects of corrosion in industrial situations.

## *H<sub>2</sub>S / Sour Gas Testing*

Through the Institute's sour gas testing program, SwRI scientists and engineers provide solutions to the oil and gas industry's down-hole production issues that arise from stress corrosion cracking. H<sub>2</sub>S / sour gas testing is carried out in both gaseous and aqueous



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*The testing and evaluation of corrosion rate, galvanic corrosion, uniform corrosion, impedance and pitting corrosion are a few examples of the extensive testing capabilities of SwRI's electrochemical testing program.*

environments in a variety of configurations including static, slow strain, tensile, fatigue and creep. SwRI offers an array of H<sub>2</sub>S and high-pressure testing including three- and four-point bend, c-ring, multi-axial loading, and pre-cracked configurations.

## *ASTM, NACE and Standardized Testing*

The EPM Lab routinely performs ASTM, NACE, and other standardized testing. In the lab's atmospheric corrosion testing program, routine tests include:

- GM9540P – accelerated corrosion test
- SAE J2334 – laboratory cyclic corrosion test
- ASTM B117 – salt fog test



DOI14636\_7389

*High-temperature and high-pressure methods can be incorporated into autoclaves that can withstand up to 22,000 psi.*



DOI138882

*A variety of creep test configurations are available including long-term creep, creep rupture, stress rupture, cyclic stress, and constant stress.*

## Keywords

Electrochemical  
Testing

Atmospheric  
Corrosion  
Testing

Coatings  
Performance

Materials  
Performance

Stress  
Corrosion  
Cracking

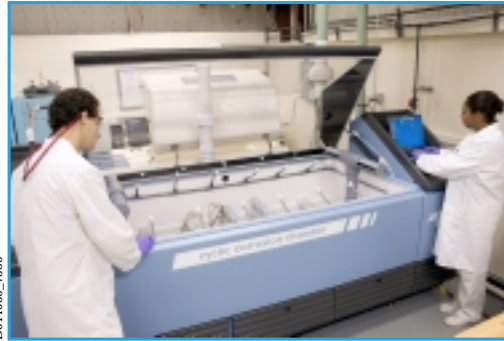
Corrosion  
Mechanisms

Sour Gas  
Testing

These tests are customarily used in the military and the automotive industry to assess the performance of coatings and materials when exposed to cyclic conditions that promote corrosion in the field.

### ***Atmospheric Corrosion Testing***

Through the EPM Lab's atmospheric corrosion testing program, SwRI engineers can establish the long-term performance of materials. Under environmental conditions simulated within the lab's two cyclic corrosion chambers, SwRI engineers can determine how factors such as humidity, precipitation and heat influence galvanic effects, pitting, stress corrosion cracking, coatings performance, and materials degradation.



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*Precipitation and particulate chemistry, wet and dry deposition, and cyclic corrosion are some of the important factors measurable using the EPM Lab's two environmental corrosion chambers.*



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*SwRI's 7,000-square-foot Environmental Performance of Materials Lab can accommodate a wide variety of tests to solve industrial-related corrosion problems.*



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*TM017796 is a NACE standardized test customarily run to assess stress corrosion cracking in samples exposed to H<sub>2</sub>S.*



*Southwest Research Institute® is an independent, nonprofit, applied engineering and physical sciences research and development organization using multidisciplinary approaches to problem solving. The Institute occupies 1,200 acres in San Antonio, Texas, and provides nearly two million square feet of laboratories, test facilities, workshops, and offices for more than 2,900 employees who perform contract work for industry and government clients.*

**We welcome  
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